QGIS

An Overview

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QGIS

- Open-source GIS platform released under the General Public License (GPL)
  - Leading open source desktop GIS program
- Developed using Qt and C++
- Greatly improved over the past 4 years

QGIS

Strengths

- Free
- Universal (Windows, Linux, OS X, Android)
- Basic viewing, operations, and analysis
- Data format conversion
- Fast performance
- Advanced operations using plugins, python scripts, or using GRASS GIS as a backend
- Database interface
- Frequent updates, active development community

Weaknesses

- Cartographic tools and symbology lacking (high quality maps)
- Can be buggy, especially with new releases
- True 3D analysis and viewing

QGIS vs. Commercial GIS

QGIS vs. Commercial GIS

QGIS

- Free
- Performs simple tasks quickly
- Limited “off-the-shelf” options

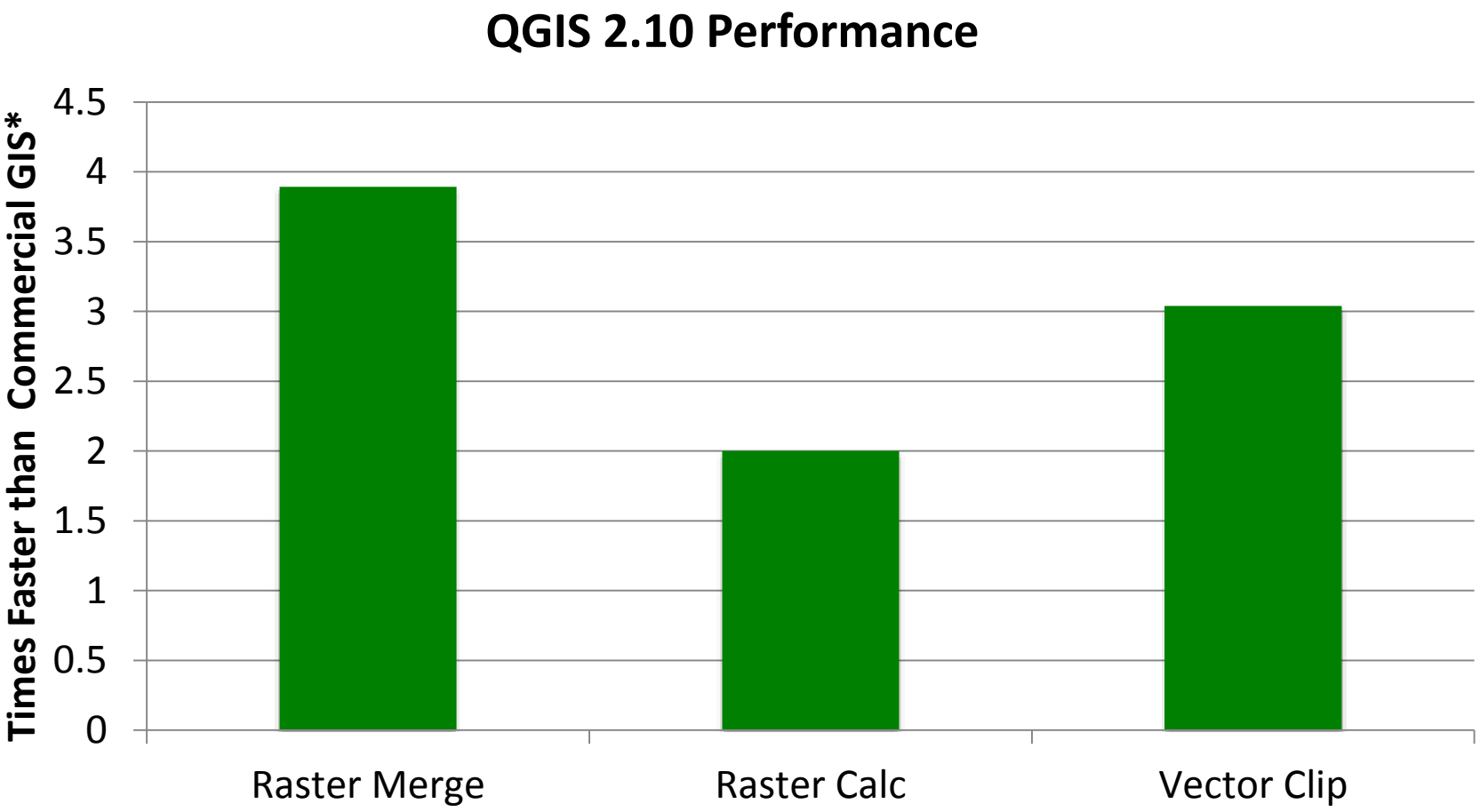
gettyimages.com

Commercial GIS

- Not free
- May or may not perform simple tasks quickly
- Many “off-the-shelf” options

quickmeme.com

Bench Test



*Performance measured testing QGIS 2.10 and ArcMap 10.2.2 on a Windows 7 virtual machine using VMWare with one processor and 8 GB memory allocated

QGIS vs. Commercial GIS

QGIS

- Ability to perform complex tasks with plugins or with python scripts
- No tin support/3d viewing
- Adequate mapping capability for many users

Commercial GIS

- Ditto and then some
- Tin support and 3D viewing
- Advanced mapping capability

QGIS vs. Commercial GIS

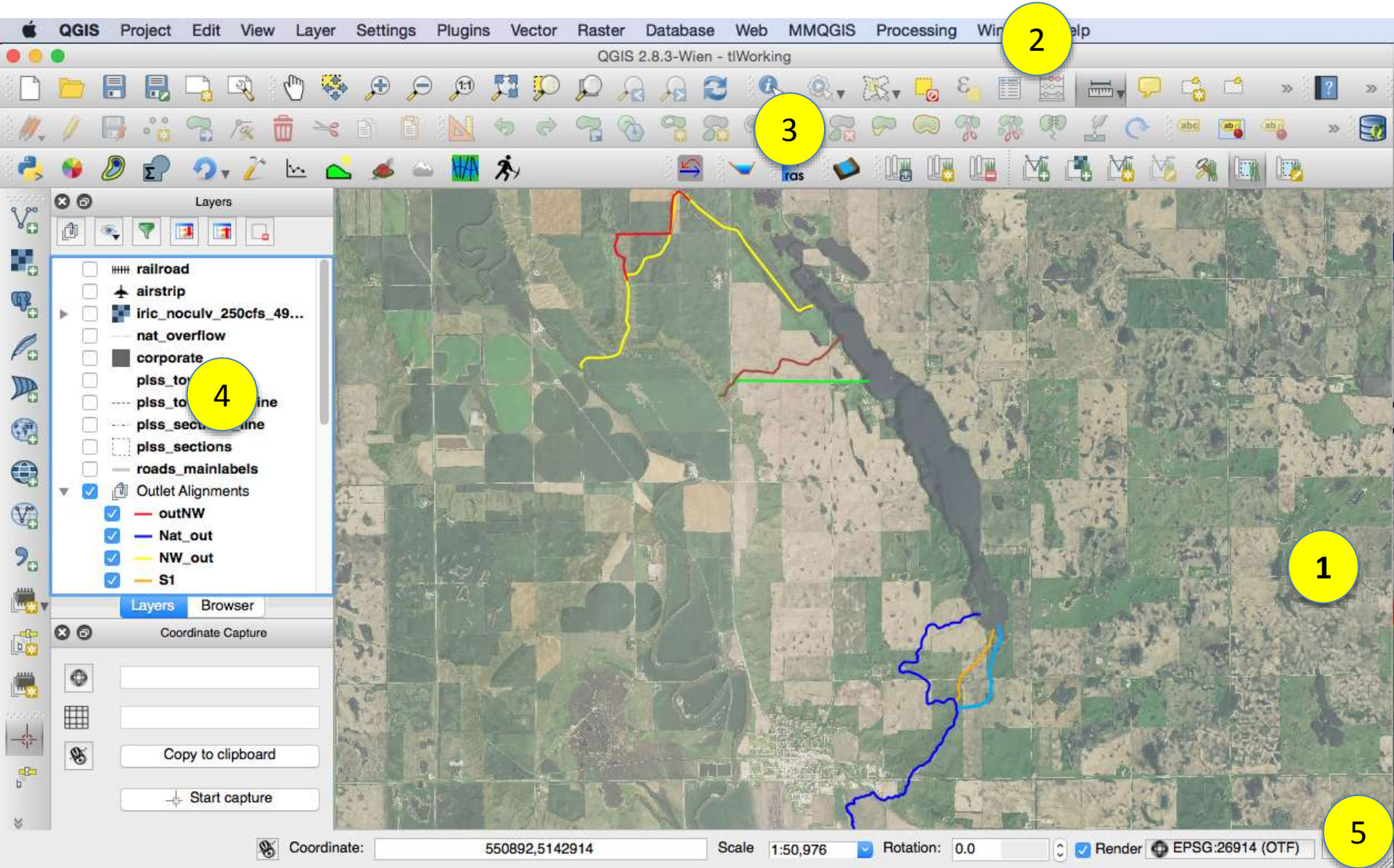
QGIS

- Crashes a lot
- Open source support system
  - Advanced users can troubleshoot errors by viewing code or function causing problems
  - Request help online from developers, bug report many times goes to original author
  - Much more responsive w/ payment!

Commercial GIS

- Crashes a lot
- Commercial support system

QGIS GUI Layout



Internal Libraries and Backend Databases

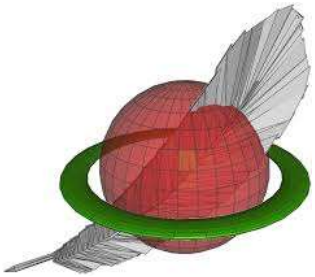
- QGIS uses efficient internal libraries

GEOS Geometry Engine Open Source

GDAL

- and useful backend databases

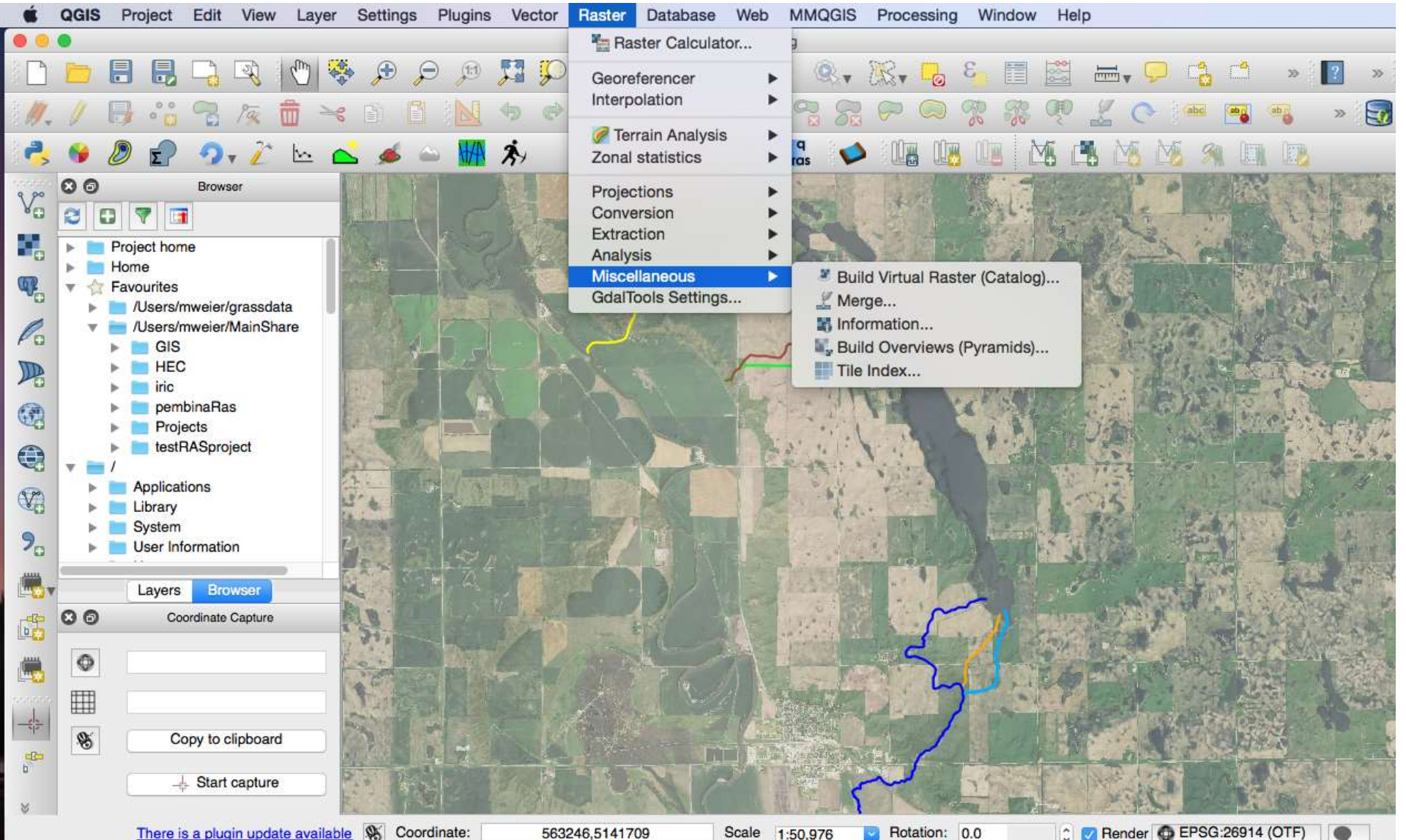
PostGIS



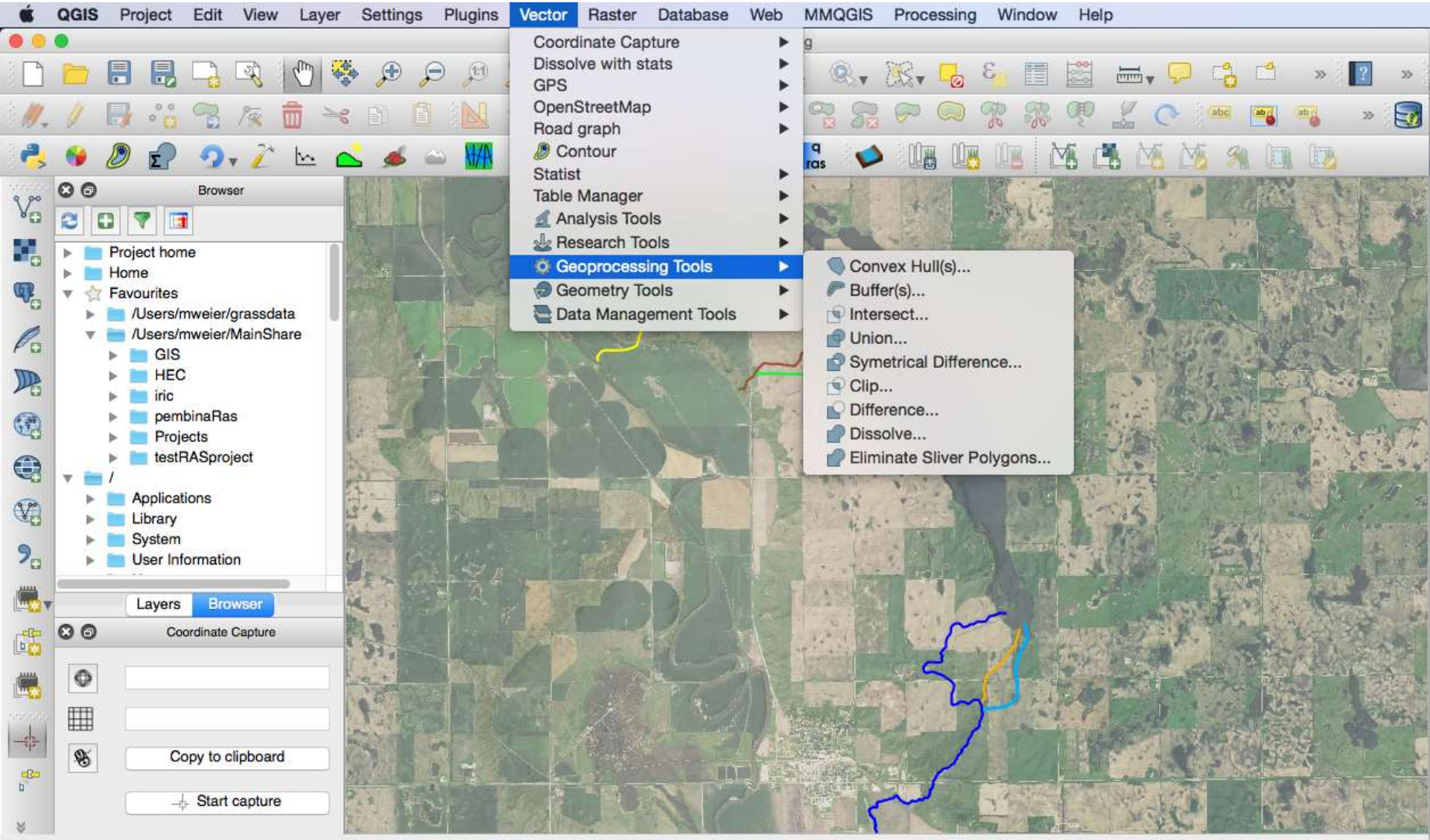
GDAL/Ogr

- QGIS relies on Geospatial Data Abstraction Library (GDAL)
  - GDAL is translator library for raster and vector geospatial data formats
    - Useful command line tools
    - GDAL Library supports over 140 raster formats
    - OGR Library supports over 80 vector formats
  - Also used in ArcGIS, GRASS GIS, Google Earth, SAGA GIS, R

GDAL (Raster) Tools

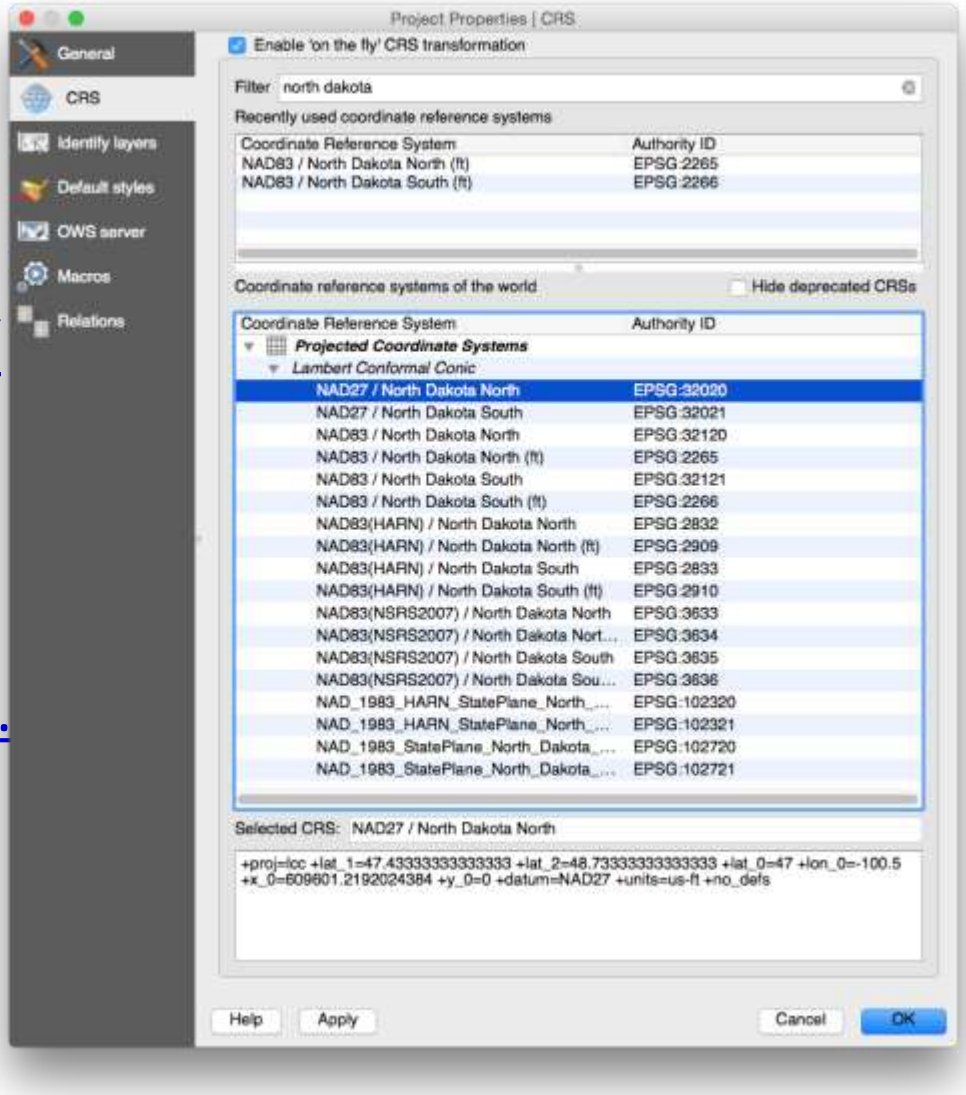


Vector Tools

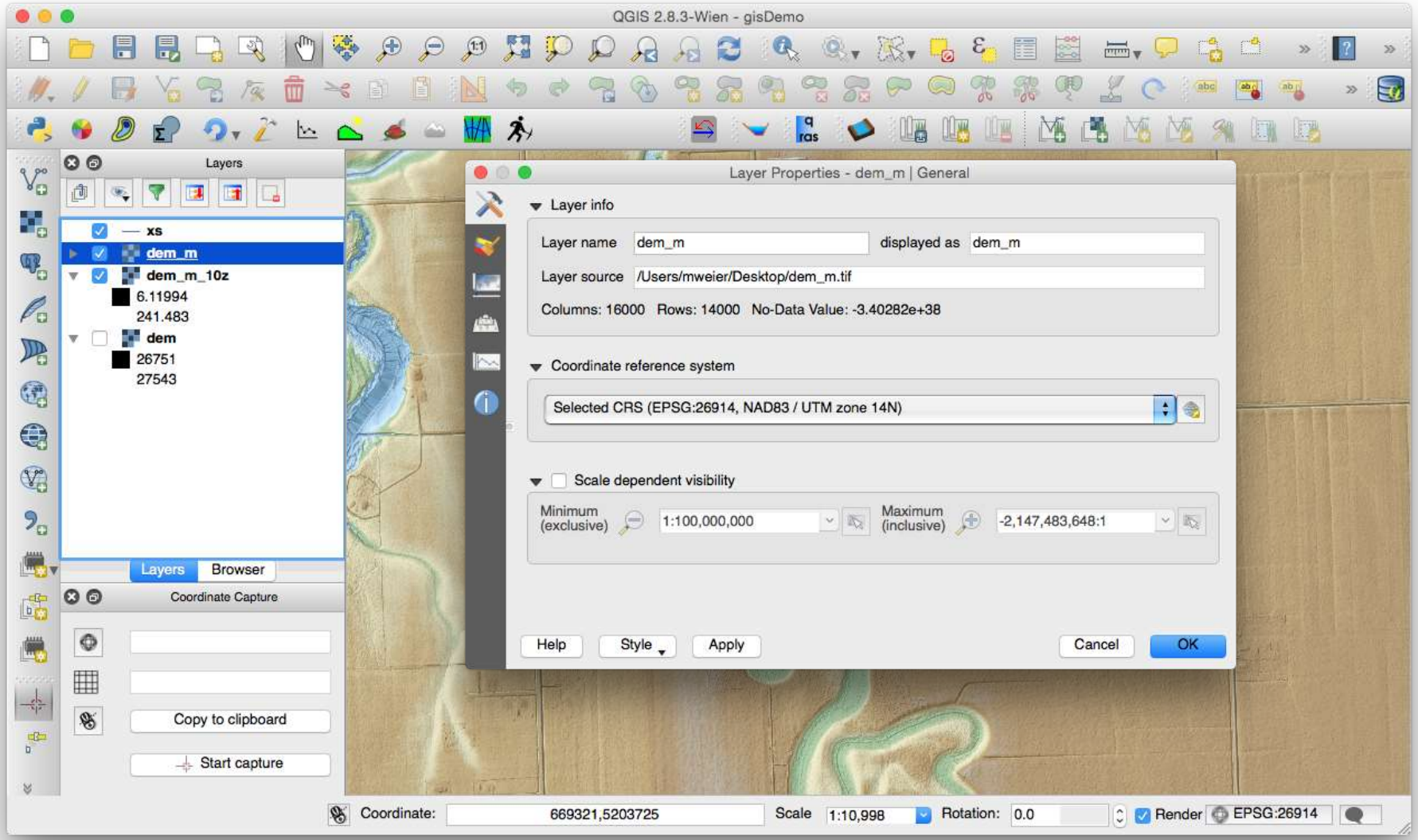


Projections/CRS

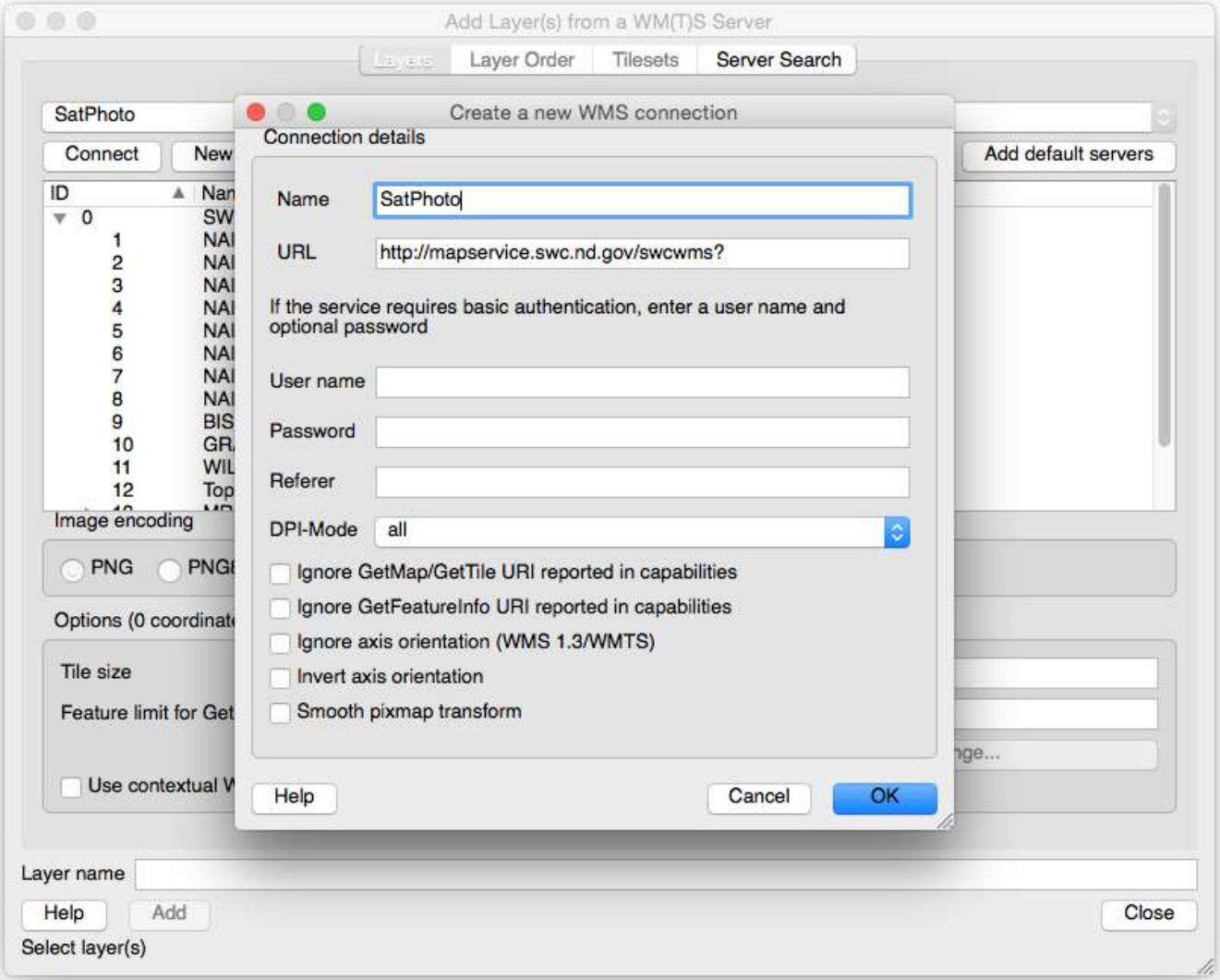
- Easy to keep track of
  - Proj4 framework
    - https://trac.osgeo.org/proj/
  - EPSG Geodetic Parameter Set Codes
    - http://spatialreference.org



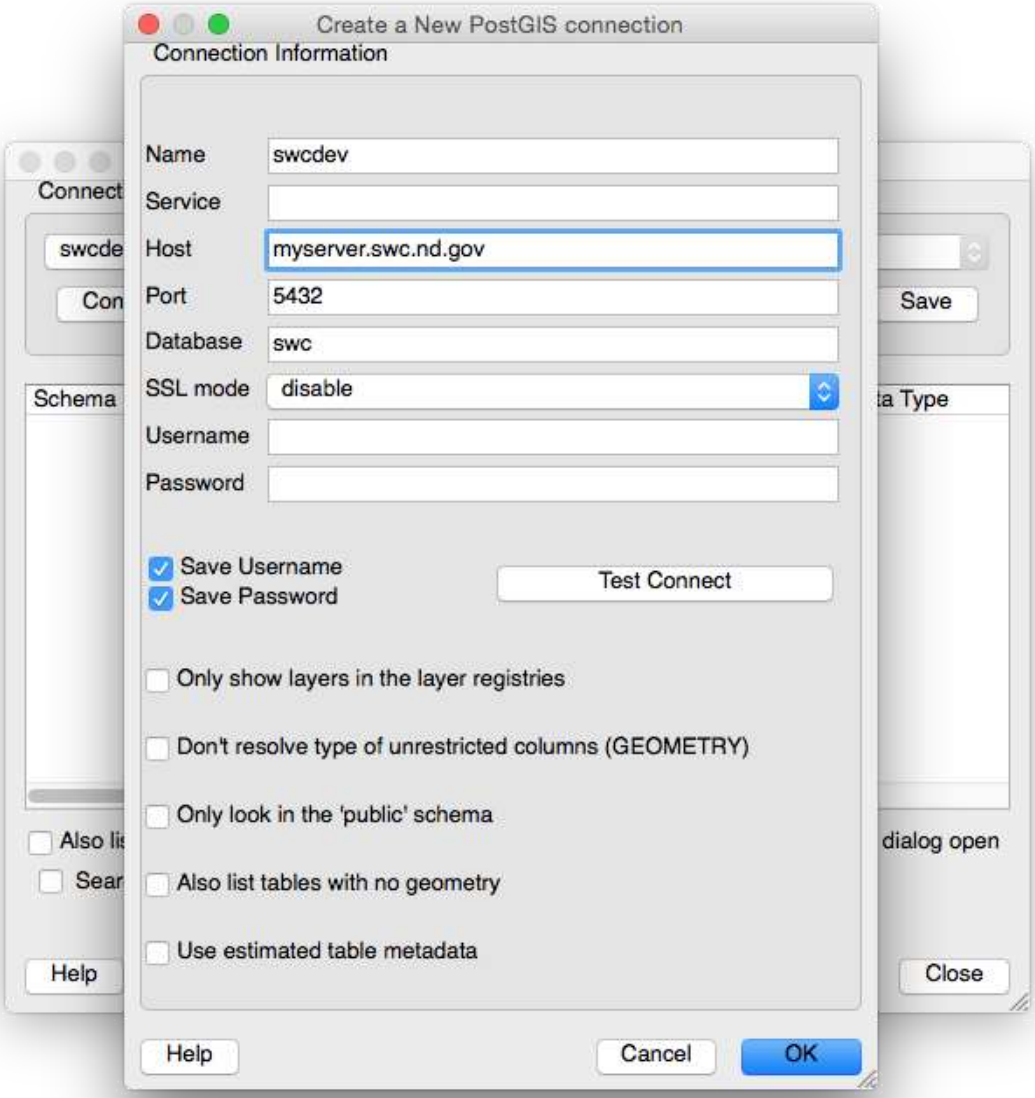
Projections



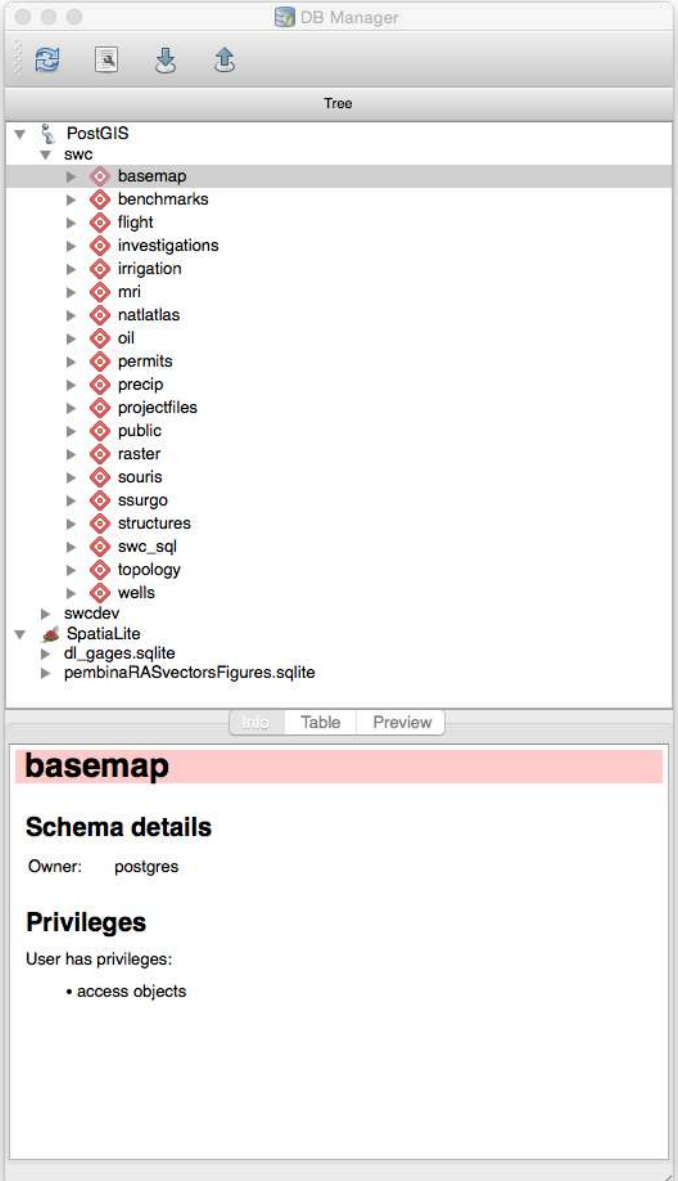
WMS Connections



Database Connections

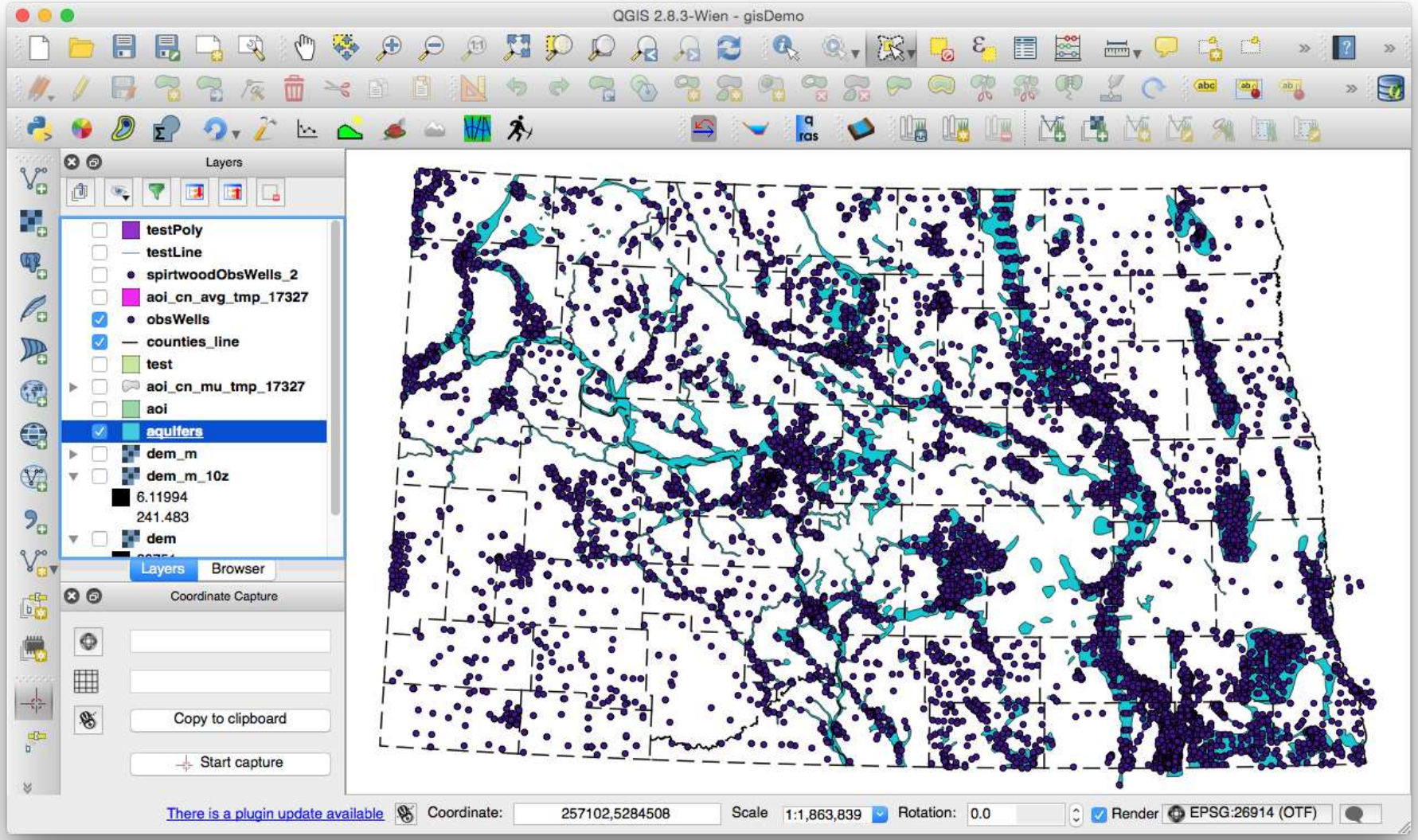


DB Manager

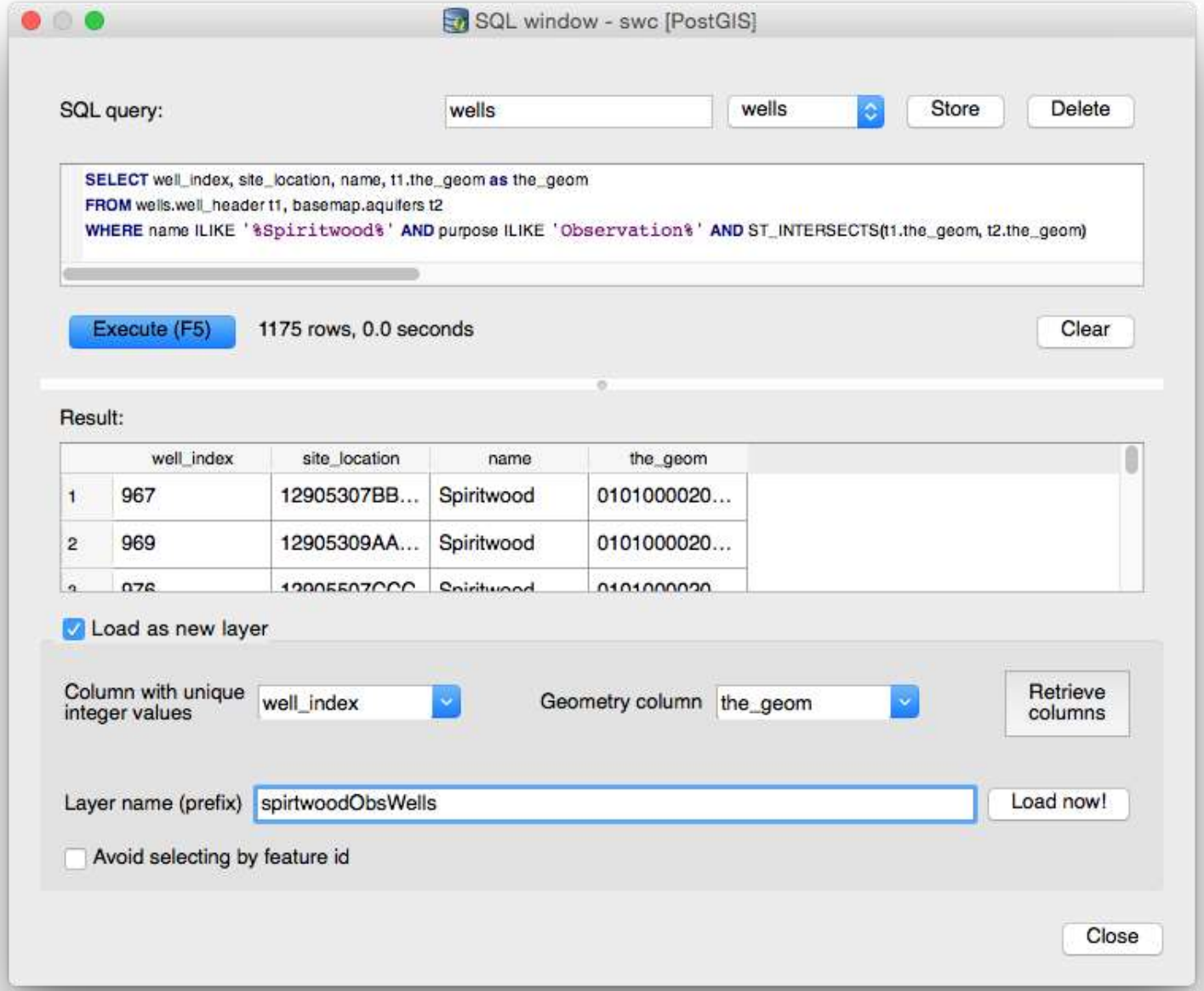

DB Manager
Tree
PostGIS
swc
basemap
benchmarks
flight
investigations
irrigation
mri
natlatlas
oil
permits
precip
projectfiles
public
raster
souris
ssurgo
structures
swc_sql
topology
wells
swcdev
SpatiaLite
dl_gages.sqlite
pembinaRASvectorsFigures.sqlite
Info
Table
Preview
basemap
Schema details
Owner: postgres
Privileges
User has privileges:
• access objects


DB Manager
Tree
PostGIS
swc
basemap
aquifers
aquifers_bak
cities_pts
civil_townships
corporate
counties
counties_line
county_centroids
dams
fire_districts
firmmapindex
geology_bedrock
geology_surface
geology_surface_linear
huc10
huc10_watersheds
huc12
huc12_subwatersheds
huc12_vers2
huc2
huc2_bak
huc2_regions
Info
Table
Preview
aquifers
General Info
Relation type: Table
Owner: postgres
Pages: 75
Rows (estimation): 278
Rows (counted): 278
Privileges: select
This user has read-only privileges.
PostGIS
Column: the_geom
Geometry: MULTIPOLYGON
Dimension: 2
Spatial ref: NAD83 / North Dakota South (ft) (2266)
Estimated extent: 1082714.50000, 60210.66797 - 2975171.75000, 1239329.50000
Extent: (unknown) (find out)
No spatial index defined (create it)
Fields
Name Type Length Null Default
1 gid int4 4 N nextval('basemap.aquifers_gid_seq1'::regclass)
2 name varchar (50) Y
3 area_acres float8 8 Y
4 area_sqm float8 8 Y
5 the_geom geometry (MultiPolygon,2266) Y

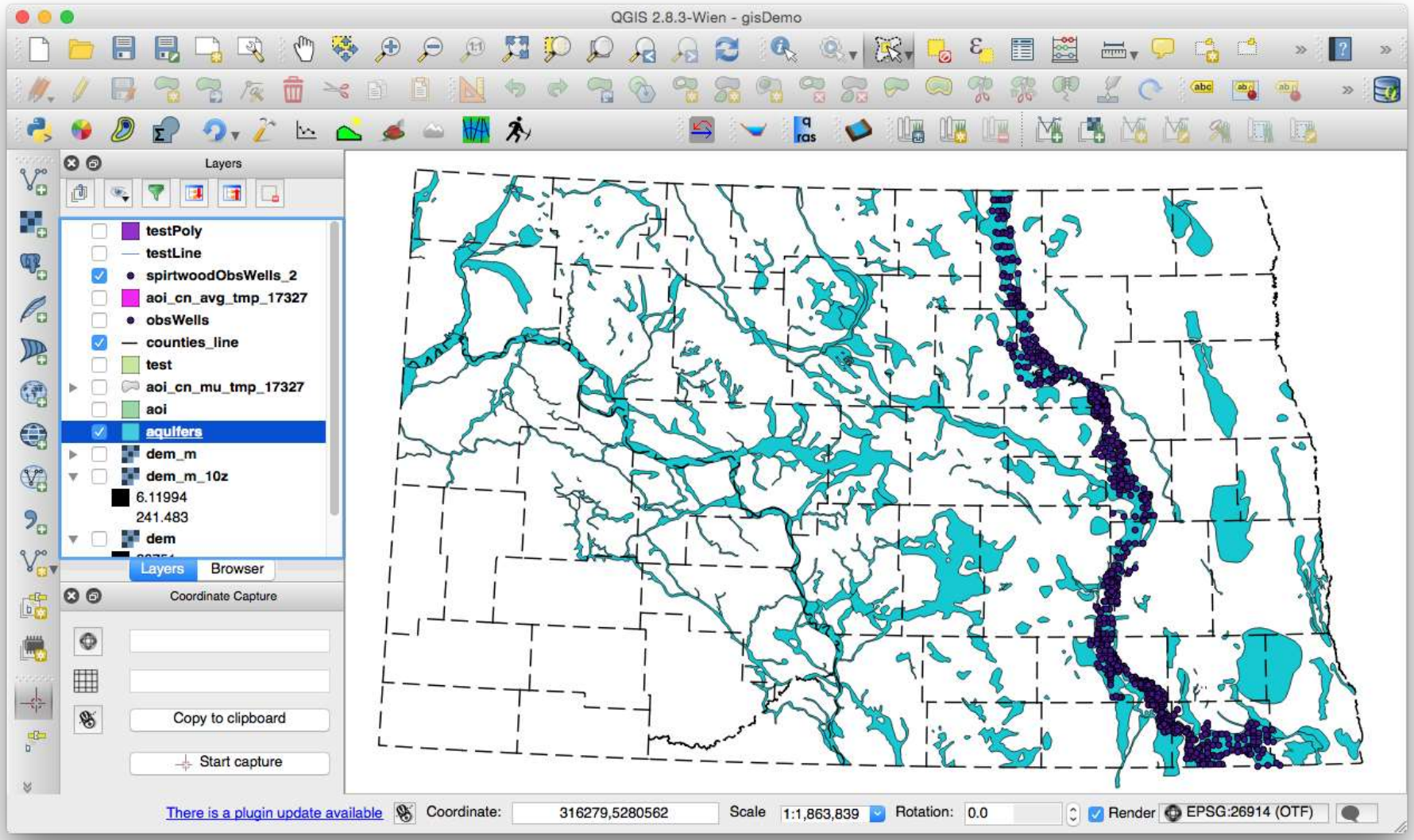
DB Manager


QGIS 2.8.3-Wien - gisDemo
Layers
testPoly
testLine
spirtwoodObsWells_2
aoi_cn_avg_tmp_17327
obsWells
counties_line
test
aoi_cn_mu_tmp_17327
aoi
aquifers
dem_m
dem_m_10z
6.11994
241.483
dem
Layers
Browser
Coordinate Capture
Copy to clipboard
Start capture
There is a plugin update available
Coordinate:
257102,5284508
Scale
1:1,863,839
Rotation:
0.0
Render
EPSG:26914 (OTF)

DB Manager


SQL window - swc [PostGIS]
SQL query:
wells
wells
Store
Delete
SELECT well_index, site_location, name, t1.the_geom as the_geom
FROM wells.well_header t1, basemap.aquifers t2
WHERE name ILIKE '%Spiritwood%' AND purpose ILIKE 'Observation%' AND ST_INTERSECTS(t1.the_geom, t2.the_geom)
Execute (F5)
1175 rows, 0.0 seconds
Clear
Result:
well_index
site_location
name
the_geom
1
967
12905307BB…
Spiritwood
0101000020…
2
969
12905309AA…
Spiritwood
0101000020…
Load as new layer
Column with unique integer values
well_index
Geometry column
the_geom
Retrieve columns
Layer name (prefix)
spirtwoodObsWells
Load now!
Avoid selecting by feature id
Close

DB Manager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Layers
testPoly
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aoi_cn_avg_tmp_17327
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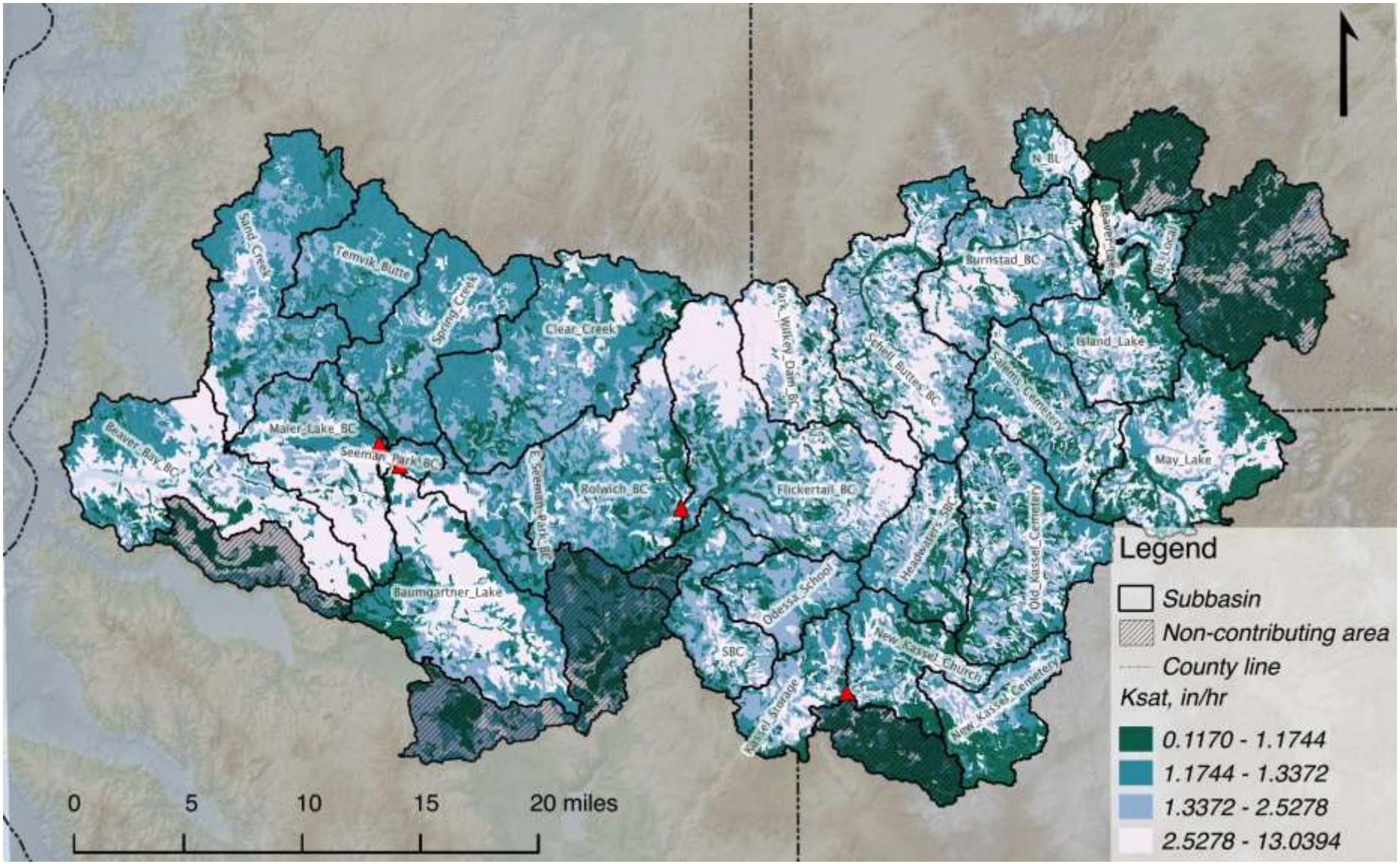
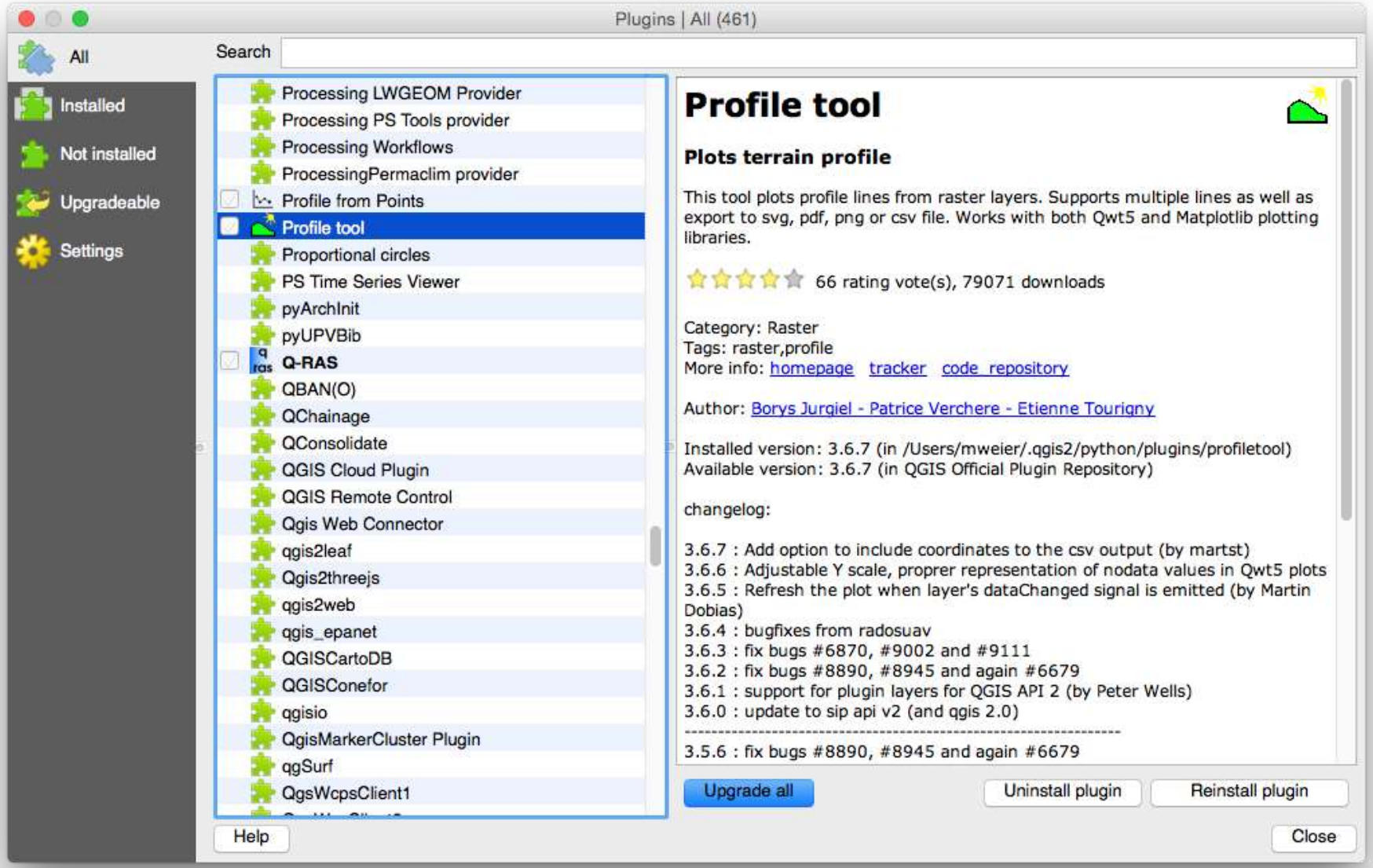
aoi_cn_mu_tmp_17327
aoi
aquifers
dem_m
dem_m_10z
6.11994
241.483
dem
Layers
Browser
Coordinate Capture
Copy to clipboard
Start capture
There is a plugin update available
Coordinate:
316279,5280562
Scale
1:1,863,839
Rotation:
0.0
Render
EPSG:26914 (OTF)

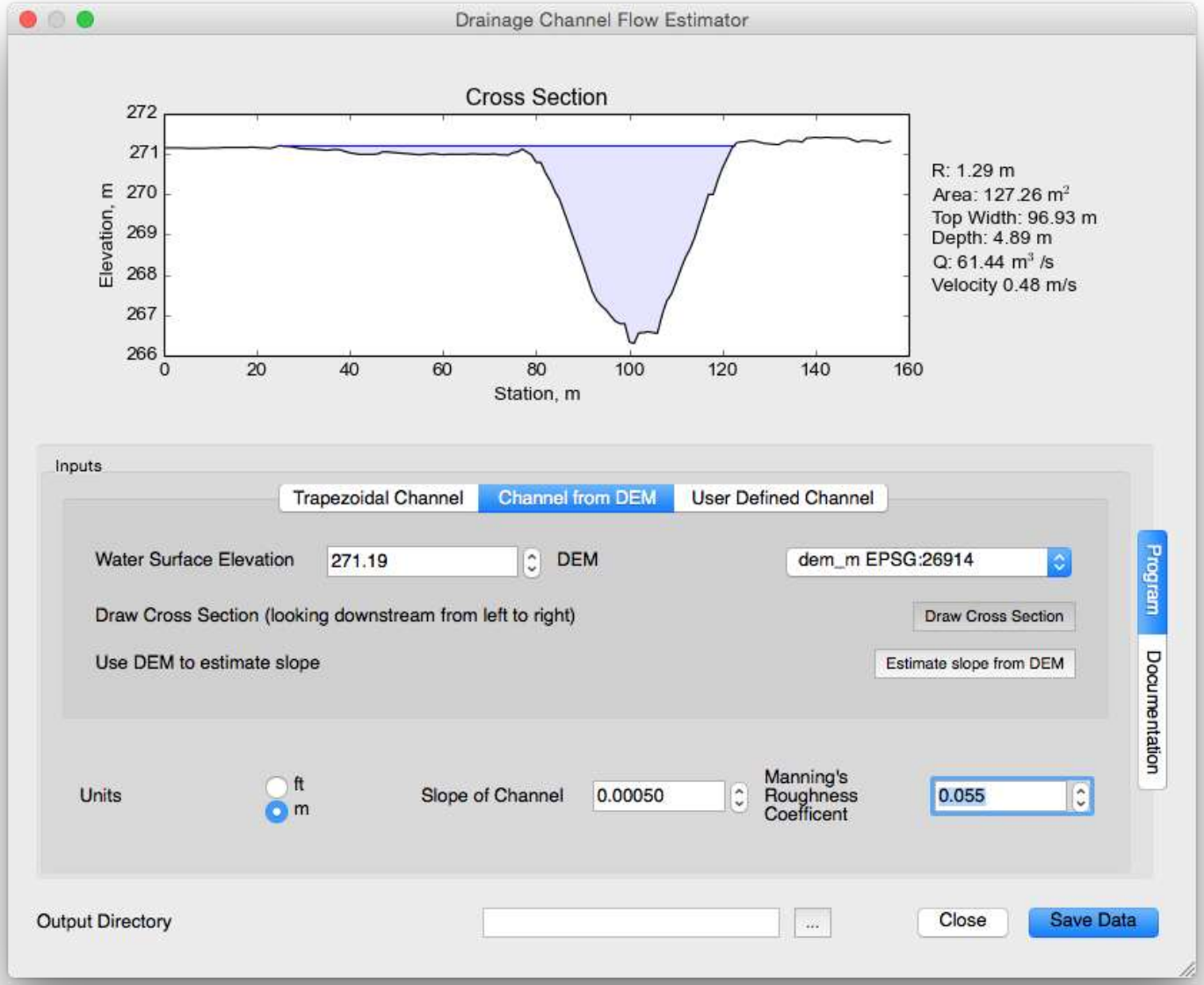
DB Manager


Sand_Creek
Temvik_Butte
Spring_Creek
Clear_Creek
Park_Wilkey_Dam_BC
Schell_Buttes_BC
Burnstad_BC
N_BL
Beaver_Lake
Island_Lake
Salem's_Cemetery
May_Lake
Maier_Lake_BC
Seeman_Park_BC
Beaver_Bay_BC
E_Seeman_Park_BC
Rolwich_BC
Flickertail_BC
Headwaters_SBC
Old_Kassel_Cemetery
Odessa_School
New_Kassel_Church
New_Kassel_Cemetery
Kassel_Storage
SBC
Baumgartner_Lake
0
5
10
15
20 miles
Legend
Subbasin
Non-contributing area
County line
Ksat, in/hr
0.1170 - 1.1744
1.1744 - 1.3372
1.3372 - 2.5278
2.5278 - 13.0394

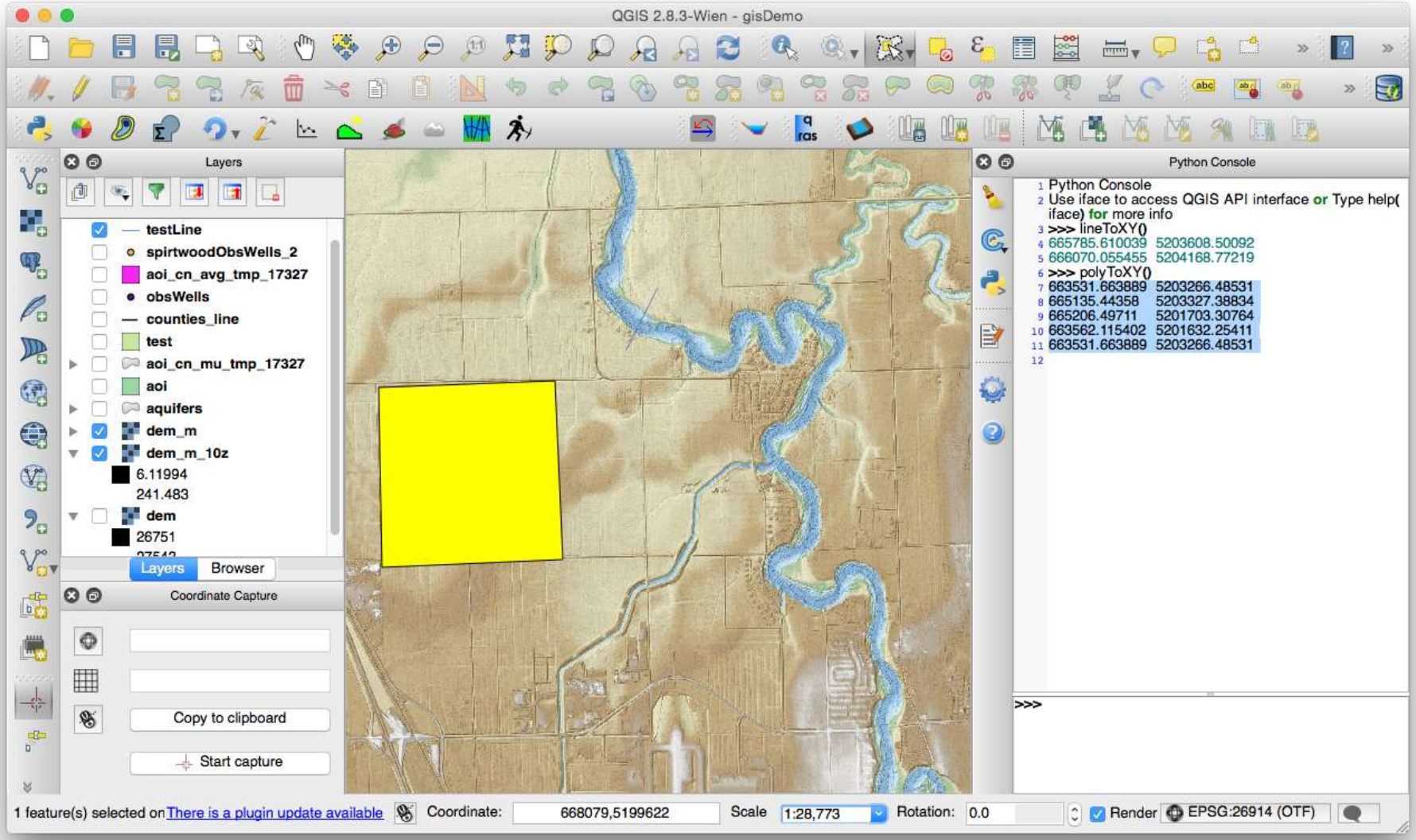
Plugins


Plugins | All (461)
All
Installed
Not installed
Upgradeable
Settings
Search
Processing LWGEOM Provider
Processing PS Tools provider
Processing Workflows
ProcessingPermaclim provider
Profile from Points
Profile tool
Proportional circles
PS Time Series Viewer
pyArchInit
pyUPVBib
Q-RAS
QBAN(O)
QChainage
QConsolidate
QGIS Cloud Plugin
QGIS Remote Control
Qgis Web Connector
qgis2leaf
Qgis2threejs
qgis2web
qgis_epanet
QGISCartoDB
QGISConefor
qgisio
QgisMarkerCluster Plugin
qgSurf
QgsWcpsClient1
Profile tool
Plots terrain profile
This tool plots profile lines from raster layers. Supports multiple lines as well as export to svg, pdf, png or csv file. Works with both Qwt5 and Matplotlib plotting libraries.
66 rating vote(s), 79071 downloads
Category: Raster
Tags: raster,profile
More info: homepage tracker code_repository
Author: Borys Jurgiel - Patrice Verchere - Etienne Tourigny
Installed version: 3.6.7 (in /Users/mweier/.qgis2/python/plugins/profiletool)
Available version: 3.6.7 (in QGIS Official Plugin Repository)
changelog:
3.6.7 : Add option to include coordinates to the csv output (by martst)
3.6.6 : Adjustable Y scale, proprer representation of nodata values in Qwt5 plots
3.6.5 : Refresh the plot when layer's dataChanged signal is emitted (by Martin Dobias)
3.6.4 : bugfixes from radosuav
3.6.3 : fix bugs #6870, #9002 and #9111
3.6.2 : fix bugs #8890, #8945 and again #6679
3.6.1 : support for plugin layers for QGIS API 2 (by Peter Wells)
3.6.0 : update to sip api v2 (and qgis 2.0)
3.5.6 : fix bugs #8890, #8945 and again #6679
Upgrade all
Uninstall plugin
Reinstall plugin
Help
Close

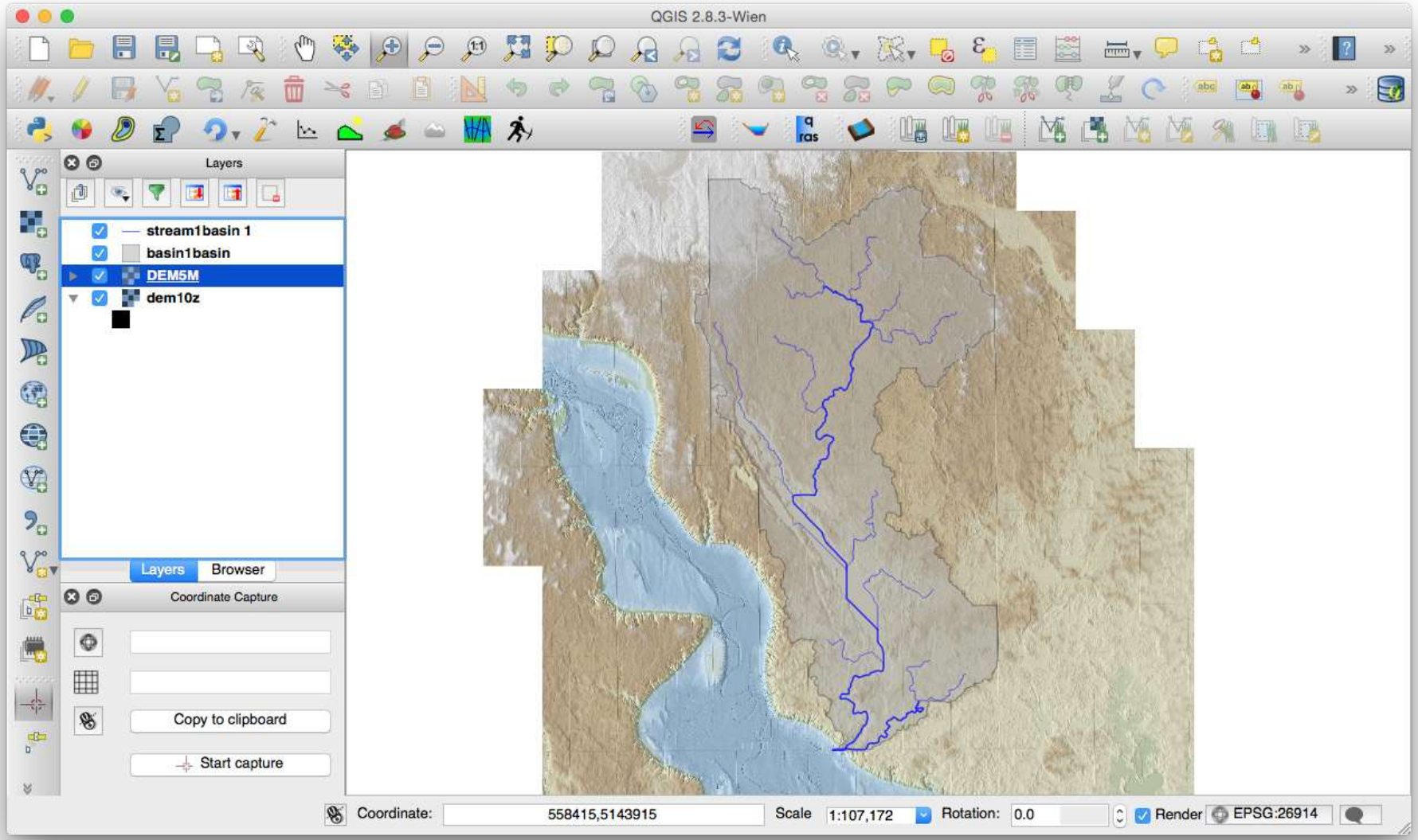
Custom Plugins



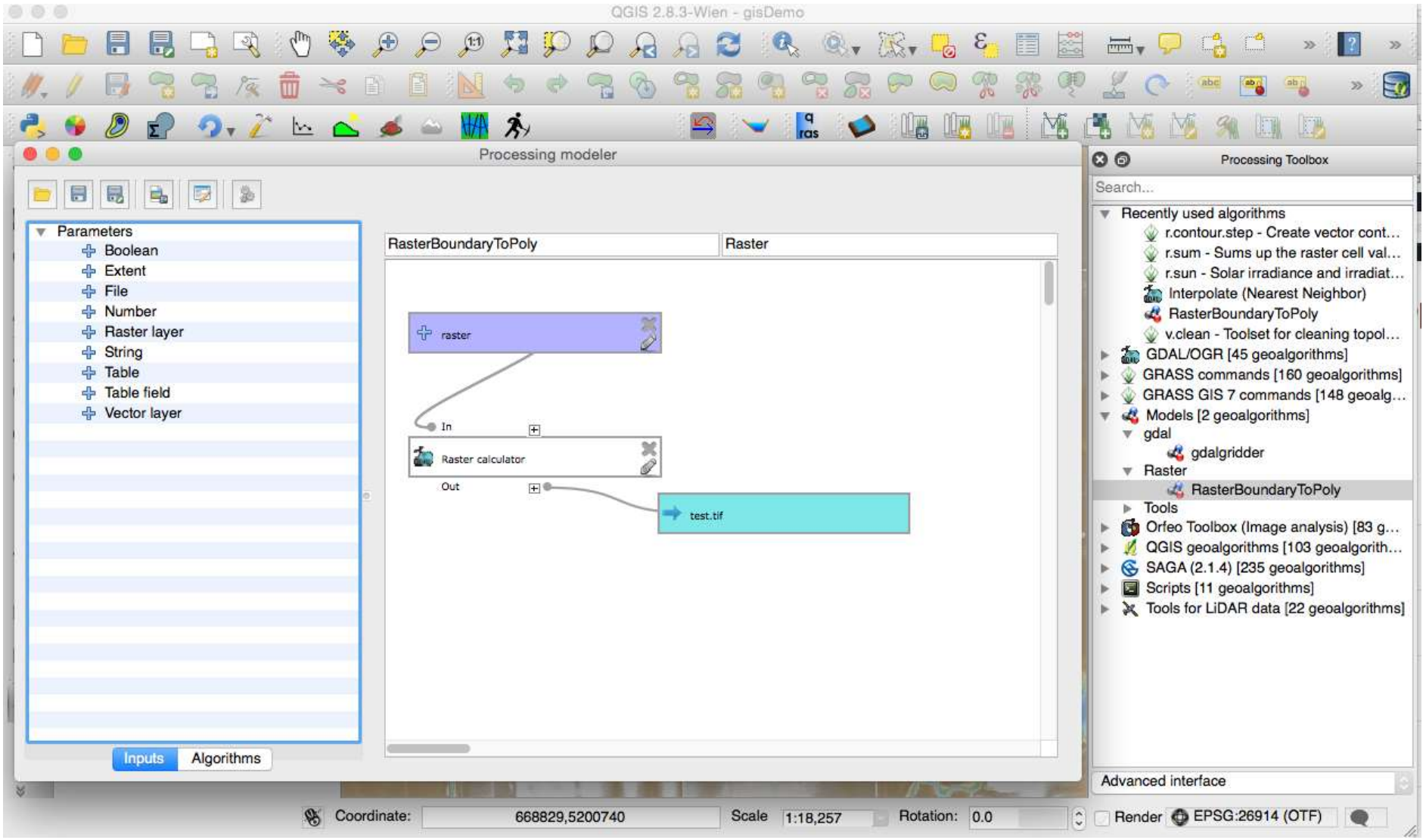
Python Console



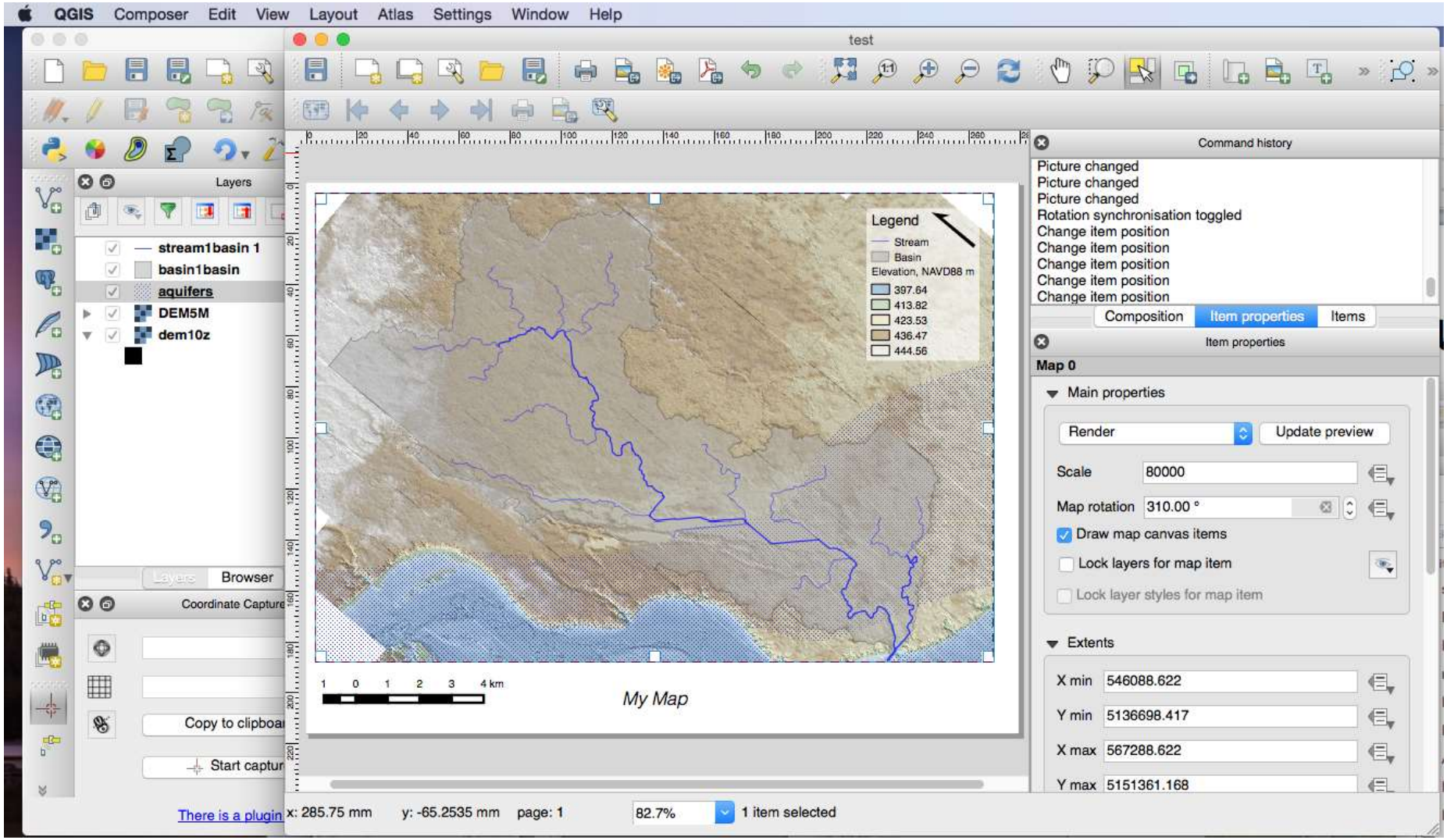
GRASS GIS Plugin



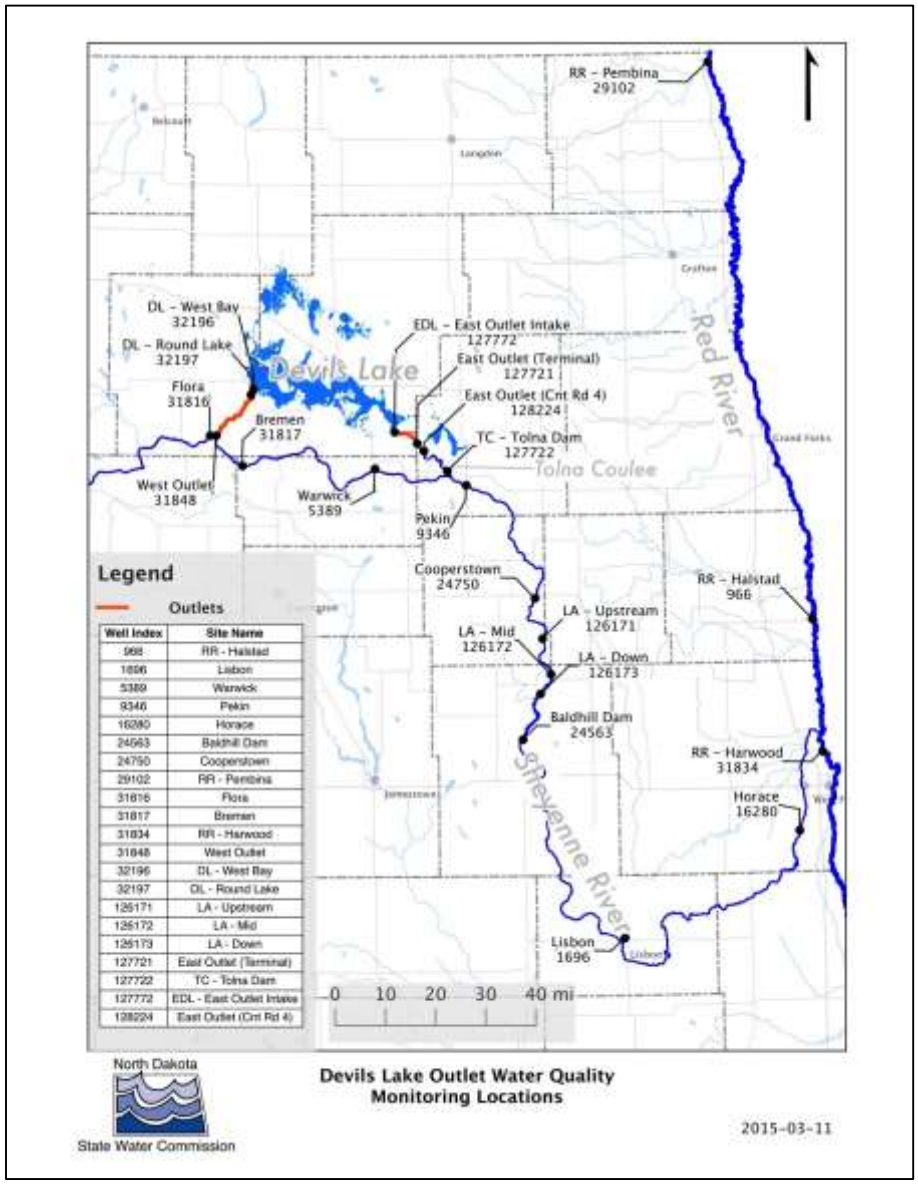
Processing Toolbox

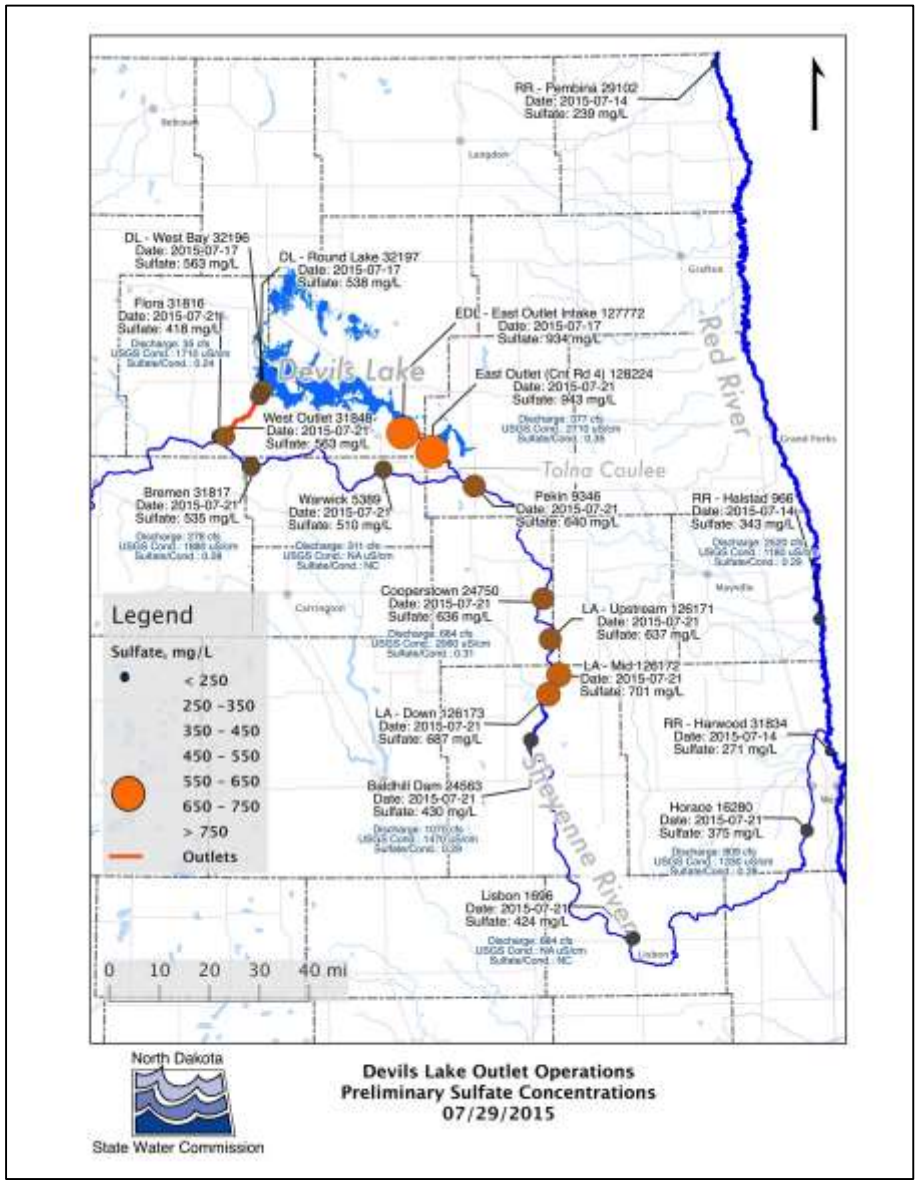


Print Composer



Print Composer

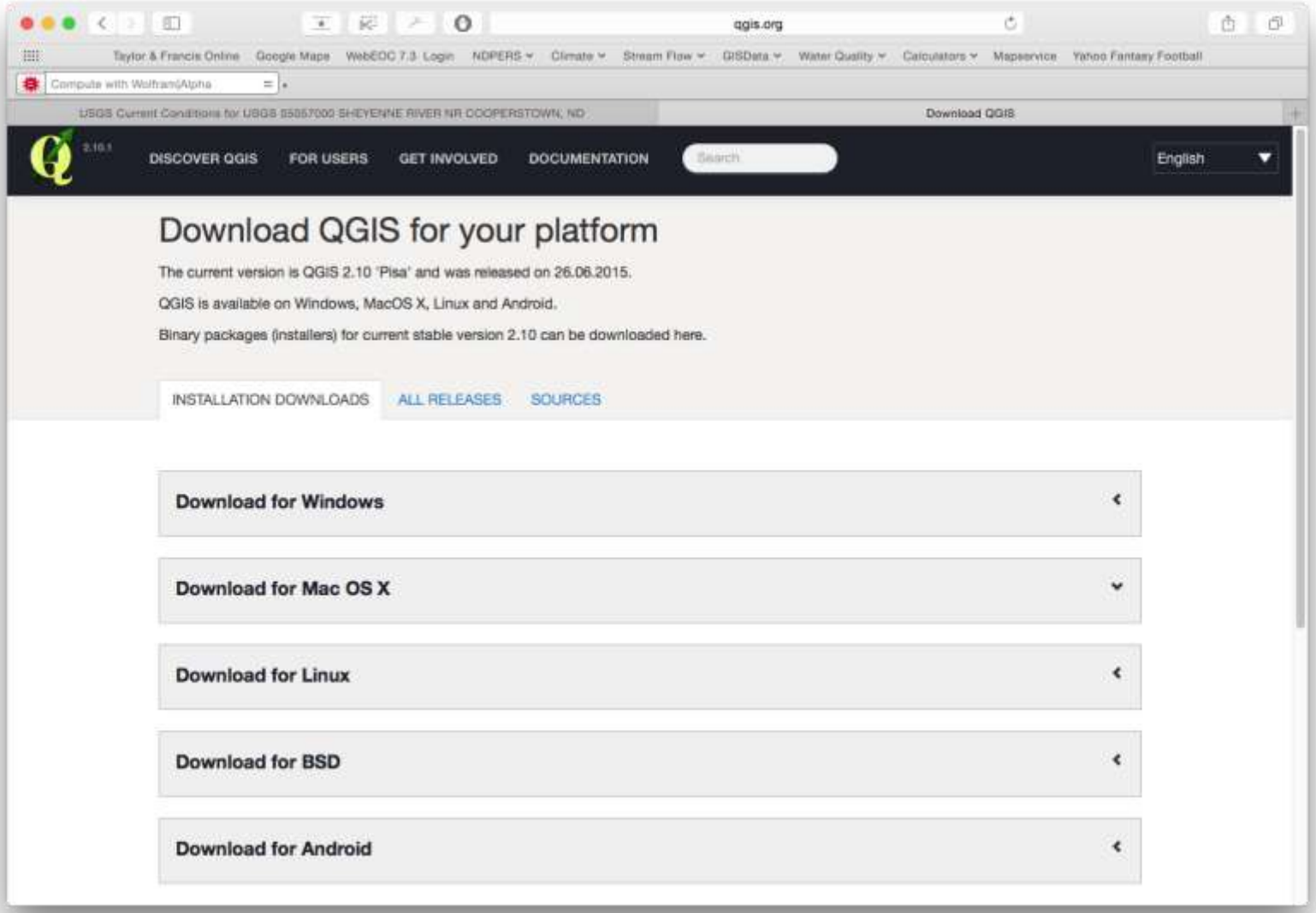




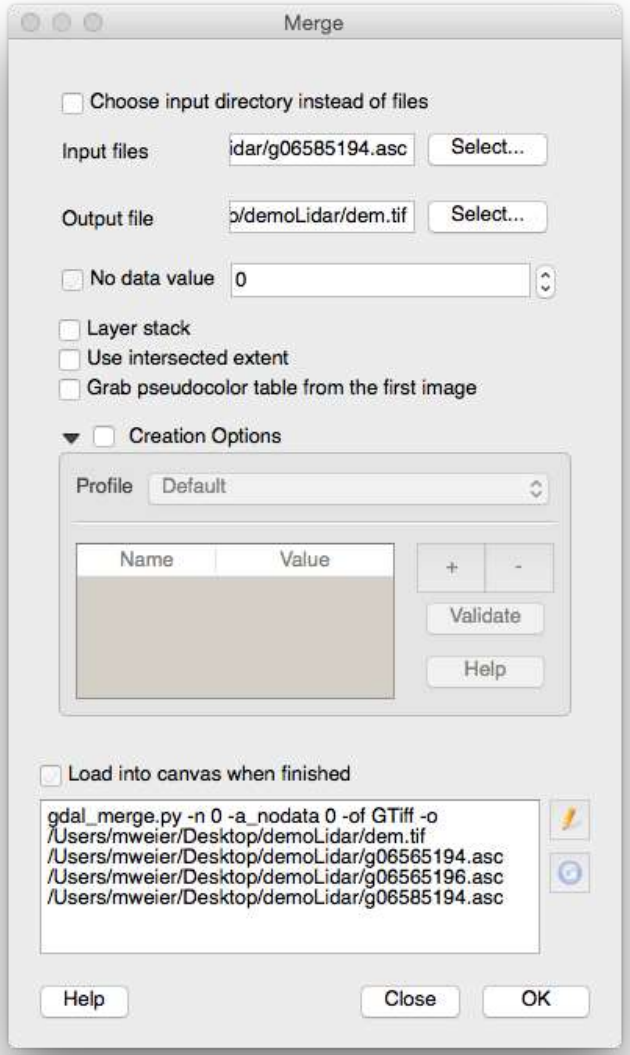
Summary

- QGIS is a simpler program than commercial GIS programs, but what it does, it does well
- Maybe most useful for beginners and advanced users

Available at qgis.org



GDAL (Raster) Tools



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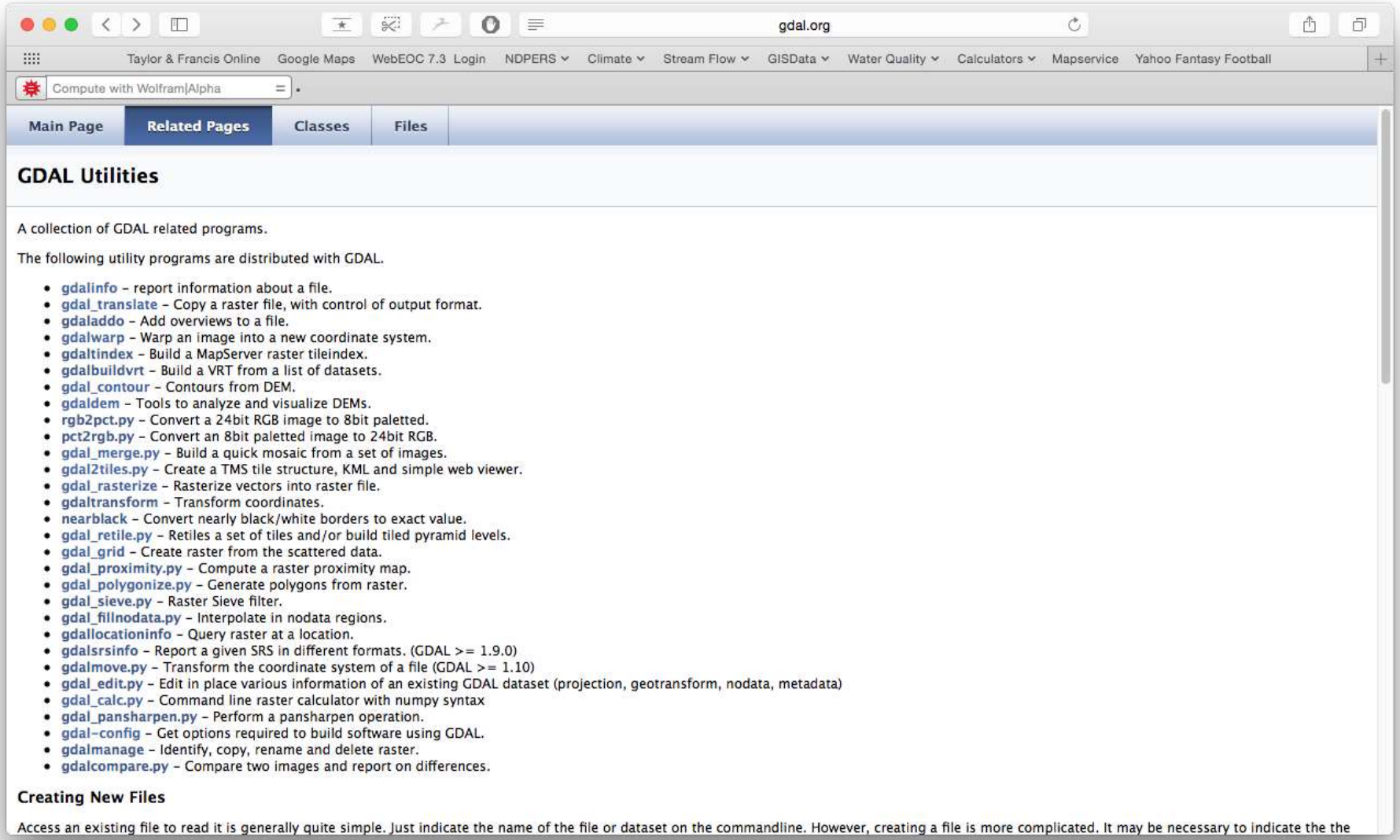

GDAL (Raster) Tools